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De Plantis Toxicariis e Mundo Novo Tropicale Commentationes XXIII

NOTES ON BIODYNAMIC PLANTS OF ABORIGINAL USE IN THE NORTHWESTERN AMAZONIA

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This article continues a series of notes on plants employed in the rich ethnopharmacopeas of the Indians of the Amazon Valley — mainly in Colombian, Ecuadorian and Peruvian territories. The primary purpose of this series is manifestly to call to the attention of phytochemical and pharmacological research specialists the hitherto neglected but extensive knowledge of biodynamic plants amongst the aboriginal populations of these regions — a knowledge destined to disappear rapidly in the face of threatening or even presently active acculturation.

Some of the notes in the following pages have come from my own ethnobotanical studies in the northwest Amazon from 1941 to the present. I have, however, drawn also upon the field research of colleagues, especially upon the studies of my former student, Dr. Homer V. Pinkley, amongst the Kofán Indians of Ecuador and Colombia and upon the rich store of knowledge of my Colombian colleague, Prof. Hernando García-Barriga of the Instituto de Ciencias Naturales, Universidad Nacional, Bogotá, Colombia. I have further incorporated into these notes several of the preliminary results of the Alpha-Helix Amazon Expedition 1976-77, Phase VII, dedicated to Ethnopharmacological Studies of the Flora and Fauna of the

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Pebas Region of the Peruvian Amazon, and I have freely quoted from the final report (unpublished) of this expedition.

I am pleased to acknowledge the collaboration of my Colombian colleagues, Prof. Alvaro Fernández-Pérez and Dr. Enrique Forero of the Herbario Nacional de Colombia, and of Prof. Oscar Tovar of the Universidad Nacional Mayor de San Marcos, Lima, as well as the specialists who have identified many of the voucher specimens.

The notes in the following pages are arranged in accordance with the Engler & Prantl system. Voucher specimens cited are deposited in the Economic Herbarium of Oakes Ames, Botanical Museum of Harvard University, the Gray Herbarium of Harvard University, the Herbario Nacional de Colombia in Bogotá, the Herbario del Museo de Historia Natural, Lima or in several of these institutions.

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HAEMODORACEAE

Schiekia orinocensis (HBK.) Meissner, Pl. Vasc. Gen. Comm. (1842) 300.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Cerro de Mitú. "On granite rocks. Flowers deep yellow." September 7, 1951. *R.E. Schultes et I. Cabrera 13898*. — Río Vaupés, between Mitú and Javareté. May 14-24, 1953. *R.E. Schultes et I. Cabrera 1927*. — Río Vaupés, Mitú and vicinity, Urania. "Flowers orange. Roots red-orange. On bare granite slope." September 27 - October 20, 1966. *R.E. Schultes, R.F. Raffauf et D. Soejarto 24325*.

The Kubeo medicine men on the Río Kuduyarí administer a tea made of the crushed leaves and roots when they treat a condition described as "shaking all over".

Nothing apparently is known of the chemistry of *Schiekia*.

AMARYLLIDACEAE

Eucharis amazonica Linden in *Illustr. Hort.* 28 (1881) 30.

ECUADOR: Dureno, Río Aguarico, Napo. "Cultivated in village; also grows in forest not far from rivers." February 7, 1966. *H.V. Pinkley 105*.

The whole plant (including the bulb) is boiled and steeped to prepare an emetic tea. Pinkley reports that the Kofáns, who call the plant *kon-si-ahipa-cho*, believe that this decoction enables them to attain greater accuracy in using the blow gun.

Apparently no chemical investigations of *Eucharis* have been published.

ARACEAE

***Anthurium crassinervium* (Jacq.) Schott var. *caatingae* R.E. Schultes var. nov.**

A *Anthurio crassinervio* principaliter foliis chartaceis (non firme coriaceis), anguste lanceolatis, spathae spadiceae colore differt.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. At base of Cerro de Mitú. "Spathe grey-purple. Spadix purple. In white sand". September 27 - October 20, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto 24202* (TYPUS in Herb. Gray).

A warm decoction made of the leaves of this coriaceous variety is employed by the Kubeo Indians of the region of Mitú as an ear wash to relieve a condition due probably to fungal infection.

ZINGIBERACEAE

***Costus amazonicus* (Loes.) Macbride in Field Mus. Publ. Bot. 11 (1931) 13.**

COLOMBIA: Comisaría del Vaupés, Río Kananarí, Cerro Isibukuri. Flowers pale pink. Bracts green, slightly red at base on both surfaces. Height 10 feet. Taiwano name = *nā-ka'*. March 8, 1951. *R.E. Schultes et I. Cabrera 13263*.

***Costus erythrocoryne* K. Schumann in Engler, Pflanzenr. Zingib. (1904) 410.**

COLOMBIA: Comisaría del Vaupés. Same locality. "Bracts all deep scarlet on both surfaces. Flowers red. Height 6 feet. Kabuyarí name = *wa'-roo-ně*. Taiwano name = *nā-ka'*. March 8, 1951. *R. E. Schultes et I. Cabrera 13262*.

Both of these species are similarly employed by the Taiwano and Kabuyarí Indians of the Río Kananarí: the leaves are dried

and pulverized, and the powder is snuffed into the nostrils to staunch persistent nose-bleeding, a condition frequent among aging individuals.

Hedychium coronarium *Koernicke* in *Retzius*, *Obs.* 3 (1783) 73.

COLOMBIA: Comisaría del Vaupés, Río Kuduyarí, Cerro Yapobodá. "Flowers white, fragrance of narcissus. Plant 6 feet tall." October 1, 1951. *R.E. Schultes et I. Cabrera* 14188.

The Kubeos take a decoction of the root to relieve pains in the chest and arms. Their name of the plant is *ma-tsě'-kö-ra*.

ORCHIDACEAE

Dichaea muricata (*Sw.*) *Lindley*, *Gen. and Sp. Orch. Pl.* (1833) 209.

ECUADOR: Dureno, Río Aguarico, Napo. October 20, 1966. *H.V. Pinkley* 526.

A wash is prepared from this orchid by the Kofáns for treating eye infections. The Kofán name is *shahasi-sehě'-pa*.

Psychmorchis pusilla (*L.*) *Dodson et Dressler* in *Phytologia* 24 (1972) 288.

Oncidium pusillum (*L.*) *Reichenbach fil.* in *Walp. Ann. Bot. Syst.* 6 (1863) 714.

ECUADOR: Dureno, Río Aguarico, Napo. December 20, 1965. *H.V. Pinkley* 11.

The Kofán Indians, who call this epiphyte *atiipa-kashaikie-si-sehě'-pa*, treat lacerations with a wash prepared by boiling the plant in water.

MORACEAE

Brosimum utile (*HBK.*) *Pittier* var. **ovalifolium** (*Ducke*) *C.C. Berg* in *Act. Bot. Neerl.* 19 (1970) 328.

COLOMBIA: Comisaría del Vaupés, Río Apaporis, Jinogojé. "Tree 40 feet tall. 1 foot in diameter." June 15, 1952. *R.E. Schultes et I. Cabrera* 16735.

The bark of this tree is extensively employed for making clothing, especially uniforms for dancing. The latex, taken cautiously, is considered a tonic.

The latex is employed medicinally in parts of Colombia in the belief that it cures asthma and other pulmonary and bronchial ailments. (García-Barriga: *Flora Medicinal de Colombia* 1 (1974) 241).

The Makunas call the tree *wa-só-gee*; the Makus, *bawn'-tēg*; the Yukunas, *ma-ree-m'a*.

Coussapoa cinnamomea Cuatrecasas in *Caldasia* 7 (1956) 288.

COLOMBIA: Comisaría del Amazonas, Trapecio Amazónica, Río Loretoyacu. October, 1945. *R.E. Schultes* 6693. — Same locality. September 1946. *R.E. Schultes et G. Black* 8269.

The Tikuna Indians of the Trapecio Amazónico formerly employed leaves and fruit of *Coussapoa cinnamomea*, pounded and mixed with mud, as a fish poison.

Coussapoa magnifolia Trécul var. **glabrescens** Cuatrecasas var. *nov.*

Differt a var. *magnifolia* typica, foliis supra leavibus glaberrimis vel sparsissim pilis, subtus tandum pilis tenuibus adpressis sparsis praeditis; stipulis subglabris; ramulis inflorescentiae minutissime hirtulis.

BRAZIL: Estado do Amazonas, Rio Negro, between Uaupés (São Gabriel) and São Felipe. October, 1947. *R. E. Schultes et J. Murça Pires* 8976 (spec. masc.) — COLOMBIA: Comisaría del Vaupés, Río Vaupés, Raudal del Yuruparí, quartzitic base. "Tree 50 feet tall" November 1951. *R. E. Schultes et I. Cabrera* 1958 (spec. fem.) (TYPUS in U.S.Nat. Herb.)

Coussapoa orthoneura Standley in *Field Mus. Publ. Bot* 17 (1937) 165.

BRAZIL: Estado do Amazonas, Rio Tikié, Taracuá. January 28 - February 9, 1948. *R.E. Schultes et F. López* 9685. — COLOMBIA: Comisaría del Amazonas, Río Apaporis, Soratama. "Gigantic tree 70 feet tall. Fruit yellow. Piunave = *koom-ka'*." August 27, 1951. *R.E. Schultes et I. Cabrera* 13774. — Comisaría del Vaupés, Río Apaporis, Raudal de Jerijerimo, "Small tree. Fruit red. On rock savannah cliff." February 14, 1952. *R. E. Schultes et I. Cabrera* 15324. — Río Vaupés, Raudal de Tatú. "Flowers yellow. Small tree, 60 feet. Hanging over cataract". October 10, 1966. *R.E. Schultes, R.F. Raffauf et D. Soejarto* 24379.

The Puinave Indians chew the fruits to cure mouth sores.

The leaves of *Schultes, Raffauf et Soejarto* 24379 gave a positive test for alkaloids with Dragendorff reagent.

Coussapoa trinervia *Spruce ex Mildbread* in *Notizbl.* 10 (1928) 416.

COLOMBIA: Comisaría del Amazonas, Río Apaporis, Soratama. "Tree. Fruit green. Flood-forest". Aug. 16, 1951. *R.E. Schultes et I. Cabrera* 13589.

The Indians of the Río Apaporis frequently chew the hard, astringent fruits to treat sores of the tongue and mouth.

Helicostylis scabra (*Macbride*) *C.C. Berg* in *Act. Bot. Neerl.* 18 (1969) 464.

COLOMBIA: Comisaría del Vaupés, Río Apaporis, Raudal Yayacopi (La Playa). "Enormous tree. Latex white. Fruit green, edible." February 18, 1952. *R.E. Schultes et I. Cabrera* 15466.

The Puinave Indians call this tree *han-shee-má*; the Makús, *meé-o*. The latex is applied to abrasions of the skin in the belief that it prevents infection.

Poulsenia armata (*Miq.*) *Standley* in *Trop. Woods*, no. 3 (1933) 4.

COLOMBIA: Comisaría del Putumayo, Río Sucumbíos, Santa Rosa. April 7-8, 1942. *R.E. Schultes* 3617.

The Kofán Indians employ the bark in the manufacture of cloth for clothing and bedding.

Pourouma Schultesii *Cuatrecasas* in *Caldasia* 7 (1956) 303.

COLOMBIA: Comisaría del Vaupés, Río Apaporis, Jinogojé. September 25, 1952. *R.E. Schultes et I. Cabrera* 17615.

The Indians of the lowermost Río Piraparaná burn the bark of this tree and apply the ashes to running sores and ulcers.

The Puinave name is *muñ*.

Pseudolmedia laevigata *Trécul* in *Ann. Sci. Nat.*, ser. 3, 8 (1847) 131.

COLOMBIA: Comisaría del Amazonas, Río Apaporis, Soratama. "Fruit red, soft. Small tree." February 4, 1952. *R.E. Schultes et I. Cabrera* 15147.

The fruits of this tree are said by the Indians of the Río Apaporis to be toxic.

Cyanogenesis has been reported from *Pseudolmedia* (Gibbs, R.D.: *Chemotaxonomy of Flowering Plants* 3 (1974) 1818).

MYRISTICACEAE

***Virola albidiflora* Ducke** in Journ. Wash. Acad. Sci. 26 (1936) 259

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. "Small tree. Flowers yellow." September 8, 1951. *R.E. Schultes et I. Cabrera* 13974.

The Kubeos call this tree *po-ham-bo'-raek*; the Tukanos, *sě-ně-'no*. Both peoples employ the fresh bark resin in treating skin sores.

There appears to be a rather generalized use of the bark resin of various species of *Virola* to alleviate or cure fungal infections of the skin and to hasten the healing of wounds (Schultes and Holmstedt in *Lloydia* 34 (1971) 61-78).

CONNARACEAE

***Rourea cuspidata* Bentham et Baker var. *densiflora* (Steyermark) Forero** in Mem. N. Y. Bot. Gard. 26 (1976) 48.

COLOMBIA: Comisaría del Amazonas, Trapecio Amazónico, Loretoyacu River. October 1945. *R.E. Schultes* 6684. Same locality. *R.E. Schultes et G.A. Black* 8305. September 1946. — Río Amazonas, La Victoria. August 30, 1939. *L. Williams* 2963.

The Tikunas of the region of Leticia, Colombia, indicate that this species is toxic, but they no longer have a use for it.

Forero (*loc. cit.*, 28) reports that the seeds and roots of some species of *Rourea* have been used as dog poisons, source of the Brazilian vernacular name *mata-cachorro*.

***Rourea glabra* Humboldt, Bonpland et Kunth**, Nov. Gen. et Sp. 7 (1825) 41.

A decoction of *Rourea glabra* is said to be employed as a medicine for sore throat (Forero: *loc. cit.*, 28).

LEGUMINOSAE

***Tachigalia cavipes* (Spruce ex Benth.) Macbride** in Field Mus. Publ. Bot. 13, pt. 3 (1943) 127.

COLOMBIA: Comisaría del Vaupés, Mitú. December 18, 1939. *E. Pérez-Arbeláez et J. Cuatrecasas* 6738. — Río Kubiyú, Guranhudá. June 30, 1958. *H. García-Barriga, R.E. Schultes et H. Blohm* 16061. — Río Kananarí. Cerro

Isibukuri, 250 m. - 700 m. November 29-30, 1951. *H. García-Barriga* 13779. — Río Piraparaná. Loma Buc-chia. August 28-31, 1952. *H. García-Barriga* 14286 — Río Piraparaná, middle course. January 9, 1952. *R.E. Schultes et I. Cabrera* 17137. — Río Vaupés, below mouth of Río Kubiyú, March 26, 1970. *D. Soejarto et T.E. Lockwood* 2430. — Right tributary of Río Macú-Paraná, upland forest. "Ingredient of *we-wit-kat-ku* ("no children medicine") of Bara-Makú. June 1-8, 1970. *P. Silverwood - Cope* 10. — Río Vaupés, about 1 km. below Mitú. "Tree 12 m. tall, spreading, inundated; leaves silvery green with a swollen rachis at first pair of leaflets housing extremely ferocious ants; flowers with calyx pale green, corolla yellow." July 3, 1976. *J.L. Zarucchi* 1810A. "Tree 15 m. tall, spreading, at edge of river, inundated. Leaves silvery white beneath; leaves with swollen rachis at the first leaflet pair, which house ants (these being the fiercest ants encountered by the collector in the Vaupés). Flowers bright yellow, showy". June 25, 1976. *J.L. Zarucchi et M. Balick* 1746.

A common plant along the banks of the rivers in the Colombian Vaupés, *Tachigalia cavipes* has a number of medicinal uses in the native ethnopharmacopeia. A tea of the leaves is widely valued in the Colombian Vaupés as a febrifuge. Bark of the stem is employed as an emetic and as a medicine when the intestinal system has been "poisoned" by ingestion of tainted fish. When the powdered leaves are mixed with the pulverized leaves of a species of *Combretum*, they are employed as a body insect-repellant. According to Zarucchi (*Zarucchi et Balick* 1746), the "bark is macerated to make a preparation used to clean bad cuts and wounds; also, the bark is powdered and used to 'dry up' cancrs of the mouth and lips from over-use of coca".

The Kubeo Indians dry and powder the leaves to mix with *fariña* (flour of *Manihot esculenta*) when there is blood in the stool.

The Makú Indians who live near the Barasana tribe along the Río Makú-Paraná apparently employ *Tachigalia cavipes* as an antifertility agent.

***Tachigalia paniculata* Aublet var. *comosa* Dwyer** in *Ann. Mo. Bot. Gard.* 41 (1954) 240.

COLOMBIA: Comisaría del Amazonas, Río Loretoyacu. September 1946, *R.E. Schultes* 8266. Same locality. September 1946, *R.E. Schultes et H. García-Barriga* 8360. — Comisaría del Vaupés, Río Apaporis, Jinogojé. September 3-11, 1952. *H. García-Barriga* 14418.

The Tikuna Indians of the Leticia area of Colombia utilize

the seeds of *Tachigalia paniculata* as a medicine, preparing a strong emetic by boiling them in water.

Tachigalia ptychophysca *Spruce ex Benth* in Martius, Fl. Brasil. 15, pt. 2 (1876) 229.

COLOMBIA: Comisaría del Vaupés, Raudal de Jerijerimo and vicinity. July 7, 1951. *R.E. Schultes et I. Cabrera 12955*.

This species of *Tachigalia* is reputed to be valuable as an aphrodisiac: the unripe pods are boiled and eaten. *Schultes et Cabrera 12955* represents apparently the second collection of this very characteristic species of *Tachigalia*. It is the first from Colombia. The type was collected by Spruce (*Spruce 2022*) at Ipanoré on the Rio Uaupés in Brazil.

EUPHORBIACEAE

Hevea brasiliensis (*Willd ex Juss.*) *Mueller-Argoviensis* in Linnaea 34 (1865) 204.

PERU: Departamento de Loreto, Provincia Maynas, Río Ampiyacu, Pebas and vicinity. "Tree 25 m. tall in secondary forest. Isolated." April 23, 1977. *T. Plowman, R.E. Schultes et O. Tovar* (Alpha-Helix Amazon Expedition, 1976-1977, Phase VII) 6995.

Hevea guianensis *Aublet*, Hist. Plant. Guian. Franç. 2 (1775) 871.

PERU: Departamento de Loreto, Provincia Maynas, Río Ampiyacu. Pucu Urquillo and vicinity (near Pebas). "Tree 60 ft. tall, 10 inches diameter. Bark smooth, tan-grey. Latex cream." April 28, 1977. *T. Plowman, R.E. Schultes et O. Tovar* (Alpha-Helix Amazon Expedition, 1976-1977, Phase VII) 7125.

In view of the report in the literature (*Raffauf, R. F, A Handbook of Alkaloids and Alkaloid-containing Plants* (1970)) of several alkaloids from the rubber tree, *Hevea brasiliensis* (presumably from cultivated material collected in Malaysia), Phase VII of the Alpha-Helix Amazon Expedition 1976-1977 carried out analyses of the two species, *H. brasiliensis* and *H. guianensis*, growing in the region of Pebas, Peru, under natural conditions. Both species were found to be alkaloid-negative.

Micrandra Spruceana (*Baill.*) *R.E. Schultes* in Bot. Mus. Leafl., Harvard Univ. 15 (1952) 217.

PERU: Departamento de Loreto, Provincia Maynas, Río Ampiyacu, Puca Urquillo and vicinity. "Tree 65 m. tall with large buttresses, forming interwoven props at base. Growing in upland primary forest. Latex white, sparse. Fruit green. Seeds brilliant, smooth, red-brown." April 22, 1977. *T. Plowman, R.E. Schultes et O. Tovar 6951*. — Pebas and vicinity. Trail north from town. "Fruits and seeds found on ground under large buttressed tree in chacara." April 10, 1977. *T. Plowman, R. E. Schultes et O. Tovar* (Alpha-Helix Amazon Expedition 1976-1977, Phase VII) 6735.

Notwithstanding intensive study of *Micrandra* (including *Cunuria*) over a large area of the northwest Amazon, I have not encountered a medicinal use of the plant, until recent research amongst the Witotos and Boras now residing in the vicinity of Pebas in Amazonian Peru. Both Indian tribes employ the sparse latex of this tree, which they recognize as "cousin" of *Hevea*, known by the Peruvian name of *conoco*, for treating sores of the gums and mucous membranes of the mouth and to staunch the flow of blood following severance of the umbilical cord. Upon questioning, the Indians assured me that not any latex—*i.e.*, latex from *Hevea* (which is locally much more abundant) and from the numerous moraceous trees of the area — would serve the same purpose, since they were more caustic and failed to effect rapid congealment of the blood.

STERCULIACEAE

Theobroma grandiflorum (*Willd.*) *K. Schumann* in Martius, Fl. Bras. 12, pt. 3 (1886) 76, t. 17.

COLOMBIA: Comisaría del Amazonas, Río Amazonas, near mouth of Río Loretoyacu and Puerto Nariño. "Tree. Cultivated. Leaves pale beneath. Staminodes deep red. Alkaloid-negative." September 13-15, 1966. *R.E. Schultes, R.P. Raffauf et D. Soejarto 24165*.

PERU: Departamento de Loreto, Río Amazonas, Iquitos. Fruit purchased in market. May 7, 1977. *T. Plowman, R.E. Schultes et O. Tovar 7301*.

During Phase VII of the Alpha-Helix Amazon Expedition 1976-1977, an examination of the seeds of *Theobroma grandiflorum* — the *cupuassú* of Brazil — was carried out. Gas chromatography - mass spectrometry indicated a single compound which was identified as tetramethyluric acid, probably a new alkaloid.

In view of this analysis, it is of interest that a spot test with Dragendorff reagent on *Theobroma grandiflorum* leaves

(Schultes, Raffauf et Soejarto 24165) gave a negative result for alkaloids.

Theobroma subincanum Martius in Buchner, Repert. Pharm. 35 (1830) 23.

BRAZIL: Estado do Amazonas, Rio Purús, Rio Apitua, vicinity of Jamamadí Indian village. Forest on terra firma. "Tree, 15 m. x 15 cm. diameter. Bark used in snuff. The bark is stripped, burnt and the ash mixed with tobacco (13929) to produce a narcotic snuff. *Cowadimani*." July 1, 1971. G.T. Prance et al. 13933. — Same locality and date. "Seedlings of tree cultivated by Jamamadí Indians as an alternative to *Theobroma* (13933) in making their narcotic snuff. Bark is burned and the ashes are added to tobacco (13928)". Cupiú. G.T. Prance et al. 13939. — Rio Cunhuá at Deni Indian village. "Forest beside stream. Tree, 12 m. x 15 cm. diameter. The bark ash used as an ingredient of Deni Indian snuff; the fruit eaten by Deni Indians. *Mapanaha* (Deni), *cupuí* (Port.)". November 29, 1970. G.T. Prance et al. 16515. — Rio Purús, Jamamadí Mission Station, 30 km. west of Labrea. Forest on terra firma. "Treelet, 3 m. tall. Bark ash mixed with tobacco leaves as components of Jamamadí snuff. *Shina* (Jamamadí)". June 28, 1974. D.G. Campbell et al. P21258.

COLOMBIA: Comisaría del Vaupés, Río Piraparaná. "Cultivated tree. Bark pounded and burned to mix with tobacco and yakee snuff." August 24, 1952. R.E. Schultes et I. Cabrera 17005.

There may well be a reason for the choice of bark of this species of *Theobroma* for the alkaline ash mixture in tobacco and *Virola* snuffs over such a wide area of the Amazon. The Indians of the Río Piraparaná region of the Colombian Vaupés prefer this ash to mix with the dried and powdered *Virola* resin. Natives in other parts of the Colombian Amazon (e.g., the Yukunas of the Río Miritiparaná) use it to make ashes for tobacco-snuff. The several reports by Prance and his collaborators are based on specimens from the Rio Purús of Brazil, an area some 600 air-miles from the Colombian locality cited above and from totally unrelated Indians. There are likewise reports, but without voucher specimens, of the employment of the bark-ashes of *Theobroma* for this purpose from numerous other Amazonian localities.

THYMELAEACEAE

Schoenobiblus peruvianus Standley in Field Mus. Publ. Bot. 6 (1936) 169.

COLOMBIA: Comisaría del Amazonas, Río Loretoyacu. October, 1946.

R.E. Schultes et H. García-Barriga 8418. — Comisaría del Putumayo, Río Guamués, Santa Rosa. September 6, 1966. *H.V. Pinkley 436.* — Río San Miguel (Sucumbíos), Santa Rosa. November 30, 1966. *H.V. Pinkley 565.*

Among the Tikuna Indians of the Leticia area of Colombia, the dried leaves of this shrub are powdered and made into a poultice to help the healing process in cases of persistent and infected cuts or wounds. The Tikunas know the plant as *ka-we 'rē-ta*. *Schoenobiblus peruvianus* is utilized by the Kofán Indians in preparing a kind of curare (Schultes in Bot. Mus. Leafl., Harvard Univ. 13 (1949) 285; *Pinkley 565*) and as a fish poison (*Pinkley 436*). Chemical studies of *Schoenobiblus* apparently have not been published.

UMBELLIFERAE

Niphogeton ternatus (*Willd. ex R. et S.*) *Mathias et Constance* in Univ. Cal. Publ. Bot. 23 (1951) 409.

COLOMBIA: Comisaría del Putumayo, road from Sibundoy to Pasto, between La María and Páramo de San Antonio. Alt. 2900-3180 m. "Tea of leaves used for colic in Sibundoy Valley." June 1, 1946. *R.E. Schultes et M. Villarreal 7814.*

This plant is highly esteemed by the Kamsá Indians of Sibundoy for the treatment of digestive disorders. A decoction of the leaves is taken. There appears to have been no phytochemical study pointing to active principles in this species.

STYRACACEAE

Styrax Tessmannii *Perkins* in Notizbl. 10 (1928) 459.

COLOMBIA: Comisaría del Amazonas, Río Apaporis, Soratama. March 26, 1952. *R.E. Schultes et I. Cabrera 16047.* — Trapecio Amazónico, Río Amazonas, Río Loretoyacu. *R.E. Schultes 7144.*

The leaves of *Styrax Tessmannii* are commonly applied crushed to fungal infections between the toes. This use is common amongst several tribes of the middle Río Apaporis.

Styrax yapobodensis (*J. Idrobo et R.E. Schultes*) *Steyermark* in Fieldiana 28 (1953) 492.

COLOMBIA: Comisaría del Vaupés, Río Kuduyarí, Yapobodá. "Golden pubescence on under side of leaf. Height 15 feet. Flowers white." October 5-6, 1951. *R.E. Schultes et I. Cabrera 14394.* — Same locality. "Small treelet

up to 8 feet." April 1953. *R.E. Schultes et I. Cabrera 20012*. — Río Kubiyú, Cerro Kañendá. Savannah. "Bush. Height 9 feet. Under part of leaf sordid. Flowers white; anthers yellow". November 10, 1952. *R.E. Schultes et I. Cabrera 18311*.

The Kubeo Indians crush the leaves of this small shrub to apply to warts.

POTALIACEAE

Potalia Amara Aublet, *Hist. Plant. Guian. Franç.* 1 (1775) 394, t. 151.

BRAZIL: Estado do Amazonas, Rio Uneiuxí, Makú Indian village, 300 km. above mouth. "Forest on terra firma. Treelet, 3 m. tall. Root bark scraped, mixed with Menispermaceae 15560 as ingredient for Makú snake-bite cure. *Awuibiden: aw* = snake (Makú)". October 23, 1971. *G.T. Prance, P.J.M. Maas, D.B. Woolcott, O.P. Monteiro et J.F. Ramos 15559*.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. "Martiguaje". September 16, 1939. *J. Cuatrecasas 6852*. — Same locality. September 8, 1951. *R.E. Schultes et I. Cabrera 13972*. — Comisaría del Amazonas, Río Apaporis, Soratama. "Shrub 2 m. tall. Flowers yellowish green. Leaves paler green beneath, dark green above. Puinave name = *chin-wee'*. Growing in flood forest". August 27, 1951. *R.E. Schultes et I. Cabrera 13726*. — Comisaría del Vaupés, Río Vaupés, Cerro de Mitú. "Flowers yellow. Used against snake-bite. Height 5 ft. *Martiguaje'*". August 20, 1960. *R.E. Schultes 22718*.

PERU: Departamento de Loreto, Provincia Maynas. Mishuyacu, road to Quistococha, near Iquitos. "Curarina". October 15, 1965. *J. Torres 109*. — Río Napo, Negro Urco. "Curarina (sp.); *cu' yacono' -le*. Treelet, 2 m.". August 27, 1966. *R.T. Martin et C.A. Lau-Cam 1312*. — Millpa Canio. "Curarina-sacha". March 26, 1968. *F. Tina et M. Tello* (Amazon Natural Drug Co.) 2074. — Provincia Mariscal Cáceres, Tocache Nuevo. "Curarina-sacha. Los nativos tomen las hojas en infusion para picadura de viboras". November 10, 1969. *J. Schunke V. 3610*. — Río Yaguasyacu, affluent of Río Ampuyacu. Brillo Nuevo and vicinity. "Bora = *okaji-kahpuu*. Fresh leaves chopped with water. Taken internally for snake-bite or against any poisonous animal (*raya, isula*). Calms the body and eliminates pain". April 12, 1977. *T. Plowman, R.E. Schultes et O. Tovar* (Alpha-Helix Amazon Expedition 1976-1977, Phase VII) 6803. — Same locality. "Unbranched treelet, 4 m. tall, in disturbed upland forest. Leaves coriaceous, shiny. Rhachis and inflorescence yellow. Fruit green. Alkaloid-negative". April 15, 1977. *T. Plowman, R.E. Schultes et O. Tovar 6895*.

It is obvious that in the northwest Amazon *Potalia Amara* is considered a valuable and very versatile remedy. The Makú Indians of Brazil mix the bark scrapings with the bark of a menispermaceous plant to treat snake-bite. The several tribes of the Colombian Vaupés likewise consider it efficacious for

snake-bite. This same use prevails also in Amazonian Peru and Brazil.

Although the plant has a wide reputation as a treatment for snake-bite, the Indians of the Vaupés in Colombia appear to value it primarily in infusion as an emetic to be used in cases of food poisoning, frequent during tribal festivals. The Bora Indians in Peru take the leaves finely chopped in water "to calm the body and eliminate pain", not only in the case of snake-bite, but for the stings of the tail of the fresh water skate (*raya*) and of large, poisonous ants (*isula*).

It is difficult to understand the paucity of chemical investigation of a plant ethnopharmacologically so important over so wide an area. Fresh material (*Plowman, Schultes et Tovar 6803*) was chemically examined on the Alpha-Helix Amazon Expedition 1976-1977: "Only squalene and methyl esters of fatty acids were found . . . No alkaloids were present". Squalene is widely distributed in plants, known from 14 families of higher plants and from yeasts.

Known as *temblador* in Venezuela, an infusion of the bark is employed as a laxative (*L. Williams 14352*). In the western Amazon of Brazil, where the plant is called *anabí* and *pao de cobra* ("snake plant"), *Potalia Amara* is recognized as toxic. The leaves and shoots are made into a bitter infusion employed in treating syphilis, and a decoction of the leaves is used as a wash for eye infections. A tea of the leaves is emetic in large doses and is taken to empty the stomach of tainted cassava flour. Folk medicine in Brazil maintains that the root is valuable in treating snake-bite (*Le Cointe, P.: Amazonia Brasileira 3 (1943) 20*).

In Peru, *Potalia Amara* is known as *sacha-mangua* (*L. Williams in Field Mus. Nat. Hist. Bot. Ser. 15 (1936) 418*), *curarina* and *curarina-sacha* ("*curarina*" is a name widely employed in Hispanic America for snake-bite potions). The most widely known term for the plant in Colombia is *martiguaje*. One of the Brazilian names, *pao de cobra*, refers to the widespread esteem that the plant enjoys as an antidote for snake venom.

It would appear that a plant of such varied therapeutic uses should be the subject of intense phytochemical study.

SOLANACEAE

Cyphomandra crassifolia (*Ort.*) *Macbride* in *Publ. Field Mus. Nat. Hist., Bot.* 8 (1930) 112.

COLOMBIA: Comisaría del Putumayo, Río Sucumbíos, Conejo and vicinity. Altitude 300 m. "Bush. Flowers green, anthers white. Fruits round, green, hard." April 2-5, 1942. *R.E. Schultes* 3652. — Puerto Ospina and vicinity. March 25-26, 1953. *R.E. Schultes et I. Cabrera* 18979. — Comisaría del Amazonas, Río Amazonas, Leticia. September 20, 1945. *R.E. Schultes* 6541. — Comisaría del Vaupés, Río Apaporis, Soratama. August 17, 1951. *R.E. Schultes et I. Cabrera* 13044. — Río Vaupés, Mitú and vicinity. September 7, 1951. *R.E. Schultes et I. Cabrera* 13903.

The Kofán Indians employ the leaves of *Cyphomandra crassifolia* for dying clay pots black. A tea of the leaves is used by the Indians in the Mitú region to expel intestinal parasites.

Scopoletin has been isolated from *Cyphomandra* (*Hegenauer, R.: Chemotaxonomie der Pflanzen* 6 (1973) 418. Tannins and tetraterpenes have likewise been reported from the genus (*Gibbs loc. cit.*, 3 (1974) 1762-1765).

Cyphomandra dolichorachis *Bitter* in *Fedde Rep.* 17 (1921) 350.

COLOMBIA: Comisaría del Putumayo, Sibundoy. Altitude 2225-2300 m. May 29, 1946. *R.E. Schultes et M. Villarreal* 7650.

The Kamsá Indian medicine men employ a decoction of the leaves as a vermifuge.

Cyphomandra endopogon *Bitter* in *Engler, Jahrb.* 54, *Beibl.* 119 (1916) 16.

COLOMBIA: Comisaría del Amazonas, Río Loretoyacu. August 19, 1964. *A. Fernández-Pérez* 6863. — Same locality. "Small tree to 6 m. tall in secondary growth. Heliophile. Corolla green; stamens white at anthesis. Fruit a berry, ovoid, yellow at maturity. Whole plant gives strong narcotic odor". January 28 - February 7, 1969. *T. Plowman, T. Lockwood, H. Kennedy et R.E. Schultes* 2332.

A spot test with Dragendorff reagent indicated that this species (*Fernández 6863*) is weakly alkaloidal.

Juanulloa ochracea *Cuatrecasas* in *Brittonia* 10 (1958) 148.

COLOMBIA: Comisaría del Vaupés, Río Apaporis, Raudal Yayacopi (La Playa) "Bush. Flowers green. Epiphyte (?)." February 16, 1952. *R.E.*

Schultes et I. Cabrera 15412. — Comisaría del Putumayo, Río Putumayo, Puerto Ospina. "Bush 15 feet tall. Flowers yellowish; bracts orange. Leaves crassulent." March 23-26, 1953. *R.E. Schultes et I. Cabrera 18960*. — Comisaría del Caquetá, Río Caquetá, Floresta, c. 15 km. down from Puerto Limón. "Climbing epiphyte shrub on fallen tree, 3 m. tall. Calyx red; corolla yellow. Leaves coriaceous." December 20, 1968. *T. Plowman 2176*.

The inhabitants in the vicinity of Puerto Limón, who call this plant *ayahuasca*, employ the leaves and the trunk to treat wounds. The vernacular name — commonly applied to an hallucinogenic plant (*Banisteriopsis Caapi*) and a preparation from it — suggests its possible use as an intoxicant (Schultes in Bot. Mus. Leafl., Harvard Univ. 23 (1972) 140).

The alkaloid parquine has been reported from this genus (Raffauf, *loc. cit.*)

Markea coccinea *L.C. Richard* in Act. Soc. Hist. Nat. Paris 1 (1792) 107.

COLOMBIA: Comisaría del Vaupés, Río Apaporis, Raudal de Jerijerimo. July 8, 1951. *R.E. Schultes et I. Cabrera 13441*. — Río Pacoa. "Vine. Flowers red." February 7-12, 1952. *R.E. Schultes et I. Cabrera 15251*. — Río Apaporis, Soratama. "Medium sized treelet. Flowers white." January 1952. *R.E. Schultes et I. Cabrera 19846*. — Río Vaupés, between Mitú and Javareté, Cerro de Tipiaca. "Climber. Flowers vermilion-orange." May 14-15, 1953. *R.E. Schultes et I. Cabrera 19305*.

The Desano Indians, who call the plant *see-nan-da*´, apply a decoction of the leaves of this relatively rare species to treat conjunctivitis and other eye affections.

Nothing apparently is known of the chemistry of *Markea*.

Solanum albidum *Dunal*, Hist. Solan. (1813) 206.

PERU: Departamento de Loreto, Pucallpa. Altitude 200 m. "In low forest. Flowers lilac. Plant 2-3 m. Vulgar name: *mullaca*. Las hojas las utilizan los indios Shipibos para labado vaginal en enfusion. El tronco tiene espinas." November 20, 1965. *J. Schunke V. 1014*.

An infusion of the leaves is reported as a vaginal wash amongst the Shipibo Indians of Peru.

Solanum apaporanum *R.E. Schultes* in Bot. Mus. Leafl., Harvard Univ. 13 (1949) 292.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. "Vine. Spines on stem. Flowers white. Fruit orange. Alkaloid-positive." September 27 - October 20, 1966. *R.E. Schultes, R.F. Raffauf et D. Soejarto 24300*.

The abundant fruits of *Solanum apaporanum* are dried and powdered by the Kubeo Indians who apply the dust to the body at night as an insect repellent.

A Dragendorff reagent spot test on fresh material indicated that this species is alkaloid positive.

***Solanum campaniforme* Roemer et Schultes, Syst. 4 (1819) 662.**

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. "Small tree, 10 feet tall. Petals deep blue; fruits green. In secondary growth. Alkaloid-positive." September 27 - October 20, 1966. *R.E. Schultes, R.F. Raffauf et D. Soejarto 24292.*

Desano Indians boil the leaves to make a strong infusion in which they bathe feet badly infected with *niguas* or sand-fleas before extracting the egg-sacs with spines.

A spot test with Dragendorff reagent indicated the presence of alkaloids in the leaves.

***Solanum jamaicense* Miller, Gard. Dict., ed. 8 (1768) no. 17.**

COLOMBIA: Comisaría del Amazonas, Leticia and vicinity. "Flowers white. Shrub." August - September, 1966. *R.E. Schultes, R.F. Raffauf et D. Soejarto 24098.*

An alkaloid test with Dragendorff reagent indicated that this species is doubtfully alkaloidal.

***Solanum mammosum* Linnaeus, Sp. Pl. (1753) 187.**

COLOMBIA: Comisaría del Putumayo, Río Putumayo, between Puerto Asís and Puerto Ospina. "Dooryard; not planted. Shrub 1.75 m. Corolla purple. Fruit bright yellow, pulp white, seeds reddish brown. Fruit used as a cockroach poison. *Cocona, cucunu, resgalgal, chufchu.*" May 16, 1963. *M.L. Bristol 1011.* — Region of Mocoa, camino viejo Pepino - Mocoa. Altitude 500-800 m. "*Regargar. Sirve para matar las cucarachas.*" August 28, 1963. *P. Juajibioy Chindoy 266.*

ECUADOR: Napo, Dureno, Río Aguarico. February 28, 1966. "Kofán = *koko'-no-cho.*" *H.V. Pinkley 172.*

PERU: Departamento de Loreto, Río Napo, Negro Urca. "Cultivated shrub. *Cocona venenosa.*" August 16, 1966. *R.T. Martin et C.A. Lau - Cam 1288.*

The efficacy of the powdered fruit as a specific poison for cockroaches is widely recognized, but use of the plant for this purpose seems nowhere to be more extensive than in the

westernmost parts of the Amazon amongst the Indians of Colombia, Ecuador and Peru.

The collection *Pinkley 172* reports an interesting use of this toxic plant: "As a pacifier for small children."

***Solanum subinerme* Jacquin, Enum. Pl. Carib. (1760) 15.**

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. "Height 4-5 feet. Flowers blue-purple. Weed." September 27 - October 20, 1966. *R.E. Schultes, R.F. Raffauf et D. Soejarto 24244.*

A spot test in the field with Dragendorff reagent indicated that this species is alkaloid-positive.

***Solanum Topiro* Humboldt et Bonpland in Dunal, Sol. Gen. Aff. Sym. (1816) 10.**

COLOMBIA: Comisaría del Vaupés, Río Apaporis, between Ríos Kananarí and Pacoa. "Flowers greenish, anthers yellow. Bush. Fruit green, turning orange. Kubeo = *bě-ta'-ka*; Taiwano = *dě-twa'*; Tatuya = *da-twa'*. Cultivated." September 1, 1951. *R.E. Schultes et I. Cabrera 13842.*

The small seeds of this edible fruit are often dried and pulverized for medicinal use: amongst the Taiwano, the powder is kept and added to powder to *Erythroxylon Coca* when the mucous membranes and tongue become irritated from over-use of coca.

***Solanum verbascifolium* Linnaeus, Sp. Pl. (1753) 184.**

COLOMBIA: Comisaría del Amazonas, Río Amazonas, near mouth of Río Loretoyacu and Puerto Nariño. "Bush, 8 feet. Flowers white or pale violet. Alkaloid-positive." September 13-15, 1966. *R.E. Schultes, R.F. Raffauf et D. Soejarto 24123.* — Comisaría del Vaupés, Mitú and vicinity. "Herb up to 3 feet. Flowers white, leaves used for washing. Leaves asperous, causing rash and itching. In secondary growth." September 27 - October 20, 1966. *R.E. Schultes, R.F. Raffauf et D. Soejarto 24228.*

This bushy species has long been employed in the Vaupés as one of the most easily available plants for washing clothes. It is not cultivated but is found growing spontaneously in every house site or *Manihot* field. The asperous leaves cause rashes and itching if handled over a long period.

The leaves give a positive test for alkaloid with Dragendorff reagent. They undoubtedly have a high concentration also of saponins.

RUBIACEAE

***Isertia rosea* Spruce** in Martius, Fl. Bras. 6, pt. 6 (1889) 284.

COLOMBIA: Comisaría del Vaupés, Río Kananarí, Cachivera de Palito. July 25, 1951. *R.E. Schultes et I. Cabrera* 13148.

The Taiwano Indians of the Río Kananarí value a decoction prepared from the leaves of this plant as an effective febrifuge. It is taken hot in quantity every several hours to reduce fever by stimulating perspiration.

***Pagamea coriacea* Spruce ex Benth** in Journ. Linn. Soc. 1 (1857) 110.

COLOMBIA: Comisaría del Vaupés, Río Apaporis, Raudal de Jerijerimo. March, 1951. *R.E. Schultes* 12108. — Same locality. June 13, 1951, *R.E. Schultes et I. Cabrera* 12467; January 21, 1952, *R.E. Schultes et I. Cabrera* 14953; March 15, 1952, *R.E. Schultes et I. Cabrera* 15931. — Río Karurú, Mesa de Yambi, Savannah Goo-ran-hoo-da', April 15-16, 1953, *R.E. Schultes et I. Cabrera* 19169.

The Indians in the region of Raudal de Jerijerimo on the Río Apaporis value this plant as a very efficacious remedy for reestablishment of the ability to walk following attacks which, in age, appear to deprive Indians from free use of the legs. The causes of this curious disease (which is not uncommon) are unknown.

The bark of the young branches is scraped and, in the fresh condition, is boiled into a decoction, which must be drunk over a period of two or three weeks. Administration of this tea is reputed to result in strong stimulation of the afflicted patient and sometimes in ability to regain use of the legs.

***Pagamea macrophylla* Spruce ex Benth** in Journ. Linn. Soc. 1 (1857) 110.

COLOMBIA: Comisaría del Vaupés, Río Piraparaná, Caño Paca. September 18, 1952. *R.E. Schultes et I. Cabrera* 17581.

The leaves of *Pagamea macrophylla* are sought by medicine men of the Makuna tribe. They are dried, pulverized and aspirated as a powder during divination ceremonies. There is no indication, however, that they have hallucinogenic properties. The Makú name of this plant in the Río Piraparaná is *ma-ha-shu'-kě-ma*.

Retiniphyllum concolor (*Spruce ex Benth.*) *Mueller-Argoviensis* in Martius, Fl. Bras. 6, pt. 5 (1881) 8.

COLOMBIA: Comisaría del Vaupés, Río Apaporis, Raudal de Jerijerimo. March 1951. *R.E. Schultes* 12110. — Río Guainía, Puerto Colombia. October 31 - November 2, 1952. *R.E. Schultes, R.E.D. Baker et I. Cabrera* 18156 — Río Negro, San Felipe. "Bush. Fruit red. Flowers green-white." November 2, 1952. *R.E. Schultes, R.E.D. Baker et I. Cabrera* 18244. — Río Guainía, Caño del Caribe. "Fruit red." November 2, 1952. *R.E. Schultes, R.E.D. Baker et I. Cabrera* 18255.

This species of *Retiniphyllum* in the northwest Amazon is believed to have antituberculous properties. The leaves are burned, and the aromatic smoke is allowed to permeate the part of the round house where the patient resides. It is thought to have purifying and therapeutic effects.

Retiniphyllum pilosum (*Spruce ex Benth.*) *Mueller-Argoviensis* in Martius Fl. Bras. 6, pt. 5 (1881) 7.

BRAZIL: Estado do Amazonas, Rio Negro, Jucabí (at mouth of Rio Curicuriarí). "Bush. Flowers white. Fruit red." January 17, 1948. *R.E. Schultes et F. López* 9633.

COLOMBIA: Comisaría del Vaupés, Río Guainía, Puerto Colombia (opposite Maroa). "Bush 4-5 feet. Fruit red." October 31 - November 2, 1952. *R.E. Schultes, R.E.D. Baker et I. Cabrera* 18155. — Río Guainía, Raudal del Sapo, below Puerto Colombia. October 31 - November 2, 1952. *R.E. Schultes, R.E.D. Baker et I. Cabrera* 18202. — Same locality and date. *R.E. Schultes, R.E.D. Baker et I. Cabrera* 18237.

The natives who live along the Río Guainía dry the fruit of *Retiniphyllum pilosum* for medicinal use during the year as an anthelmintic.

Retiniphyllum Schomburgkii *Mueller-Argoviensis* in Martius, Fl. Bras. 6, pt. 5 (1881) 12.

COLOMBIA: Comisaría del Vaupés, Río Negro, San Felipe. October 31 - November 2, 1952. *R.E. Schultes, R.E.D. Baker et I. Cabrera* 17997.

The fruits of *Retiniphyllum Schomburgkii* are considered to be effective as a vermifuge amongst the Indians of the upper Río Negro area and the Río Guainía.

Retiniphyllum speciosum (*Benth.*) *Mueller-Argoviensis* in Martius, Fl. Bras. 6, pt. 5 (1881) 10.

BRAZIL: Estado do Amazonas, Rio Uaupés, Serra Wabeesee, below Bela Vista. November 17, 1947. *R.E. Schultes et J. Murça Pires* 9139.

COLOMBIA: Comisaría del Vaupés, Río Negro, San Felipe. "Small tree or large bush. Fruit red. Flowers white and red." December 12, 1947. *R.E. Schultes et F. López* 9327.

The fruit of *Retiniphyllum speciosum* is considered by the Kuripakos of the Río Negro to be an efficient vermifuge when eaten in quantity.

***Retiniphyllum truncatum* Mueller-Argoviensis** in Martius, Fl. Bras. 6, pt. 5 (1881) 11.

COLOMBIA: Comisaría del Vaupés, Río Apaporis, Raudal de Jerijerimo. "Fruit red, edible. Small bush." January 13, 1951. *R.E. Schultes et I. Cabrera* 12464. — Same locality. "Bush up to 5 feet tall. Leaves and petioles sticky when slightly dried. Flowers white. Floral axis bright red." March 1951. *R.E. Schultes* 12111. — Same locality. June 13, 1951. *R.E. Schultes et I. Cabrera* 12453. — Same locality. "Bush, 4 feet tall. Flowers white, red at centre. Fruit scarlet." September 16, 1951. *R.E. Schultes et I. Cabrera* 14009. — Same locality. November 27, 1951. *R.E. Schultes et I. Cabrera* 14628. — Río Guainía, Puerto Colombia. October 31 - November 2, 1952. *R.E. Schultes, R.E.D. Baker et I. Cabrera* 18170 — Río Kubiyú, Cerra Kañendés. November 10, 1952. *R.E. Schultes et I. Cabrera* 18366. — Río Paraná Pichuna. June 1953. *Schultes et Cabrera* 19943. — Comisaría del Amazonas, Río Caquetá, La Pedrera, Cerro de La Pedrera. October 2, 1952. *R.E. Schultes et I. Cabrera* 17681.

The Taiwanos, who live near the Raudal de Jerijerimo, value the resin of this bush for treating hemorrhoids and other causes of rectal bleeding, applying the resin to the affected area with the finger over a period of several days. The resin must be taken from the fresh plant. The Taiwano name for *Retiniphyllum truncatum* is *bov-fee'*.